ABSTRACT

A phase change optical recording medium together with methods for optimally initializing and recording feasible for carrying out read/write/erase operations at multiple recording velocities ranging from 4.8 m/sec to 30 m/sec. Preferably, a recording layer included in the recording medium essentially consists of Ag, In, Sb and Te, with the proportion in atom % of a(Ag): b(In): c(Sb): d(Te), with $0.1 \leq a \leq 7$, $2 \leq b \leq 10$, $64 \leq c \leq 92$ and $5 \leq d \leq 26$, provided that $a + b + c + d \geq 97$. Initializing the recording medium uses a scanning beam spot from a high power semiconductor laser having energy density input equal to, or less than, 1000 J/m^{20}, scanning speed of the beam spot in the range of 3.5 m/sec to 6.5 m/sec^{0}, and intensity of laser emission equal to, or greater than 330 mW. Determining an optimum recording power includes at least calculating a normalized gradient g(P), from the equation $g(P) = (m/\Delta m)/(P/\Delta P)$, where ΔP is an infinitesimal change in the vicinity of recording power P, and Δm is an infinitesimal change in the vicinity of signal amplitude m.